

WHAT IS CLAIMED IS:

1. A method for increasing cell survival in cell therapy treatment, the method comprises the steps of inducing in a cell the expression of at least one cell survival gene, introducing and expressing in said cell a nucleic acid sequence encoding a functional transcription factor selected from the group consisting of EPAS1, HIF-1 and HIF-3 or a functional analog thereof.
2. The method of claim 1, characterized in that the cell survival gene is a cardioprotective gene.
3. The method of claim 2, characterized in that said cardioprotective gene is selected from the group consisting of LIF, LIF-R and CT-1.
4. The method of claim 3, characterized in that said cardioprotective gene is CT-1.
5. The method of claim 3, characterized in that said cardioprotective gene is LIF.
6. The method of claim 3, characterized in that said cardioprotective gene is LIF-R.
7. The method of claim 1, characterized in that said nucleic acid sequence is a cDNA.
8. The method of claim 1 or 2, characterized in that the cell is a mammalian cell.
9. The method of claim 7, characterized in that the mammalian cell is selected from the group consisting of myoblast, skeletal muscular cell, cardiomyocyte, smooth muscle cell, bone marrow cell, endothelial cell, endothelial progenitor cell, fibroblast and embryonic stem cell.
10. The method of claim 1, characterized in that said nucleic acid sequence is introduced into the cell using a method selected from the group consisting of

adenoviral infection, and plasmid, cosmid or artificial chromosome transfection and electroporation.

11. The method of claim 10, characterized in that it further comprises the step of transplanting, into the heart of a compatible recipient, a plurality of said cells.

12. The method of claim 11, characterized in that said transplantation is autologous.

13. The method of claim 11 or 12, characterized in that said transplantation improves the mammal's cardiac functions.

14. The method of claim 1, for the treatment of PVD.

15. The method of claim 1, for wound healing.

16. A method for increasing the metabolic activity of a muscular cell, comprising the step of introducing and expressing in said cell a nucleic acid sequence encoding a functional transcription factor of EPAS1 or a functional analog thereof.

17. The method of claim 16, characterized in that said transcription factor induces the expression of at least one cell survival gene selected from the group consisting of LIF, LIF-R, CT-1.

18. The method of claim 16 or 17, wherein said transcription factor induces the expression of a CT-1, a cardioprotective gene.

19. The method of claim 14 for the treatment of coronary and cardiac disorders.

20. A method for improving cardiac tissue functions of a mammal, comprising the step of providing to the cardiac tissue of said mammal a plurality of genetically modified cells expressing a nucleic acid sequence encoding a functional transcription factor of EPAS1 or a functional analog thereof.

21. The method of claim 17, wherein said genetically modified cells are provided by injecting directly said nucleotide sequence in the cardiac tissue of said mammal.

22. The method of claim 17, wherein said genetically modified cells are provided by transplanting into said cardiac tissue a plurality of cells genetically modified for expressing said transcription factor, and wherein said cells originate from a compatible donor.

23. The method of claim 22, wherein said transplantation is autologous.

24. The method of any one of claims 17 to 23, wherein said transcription factor induce the expression of at least one cell survival gene selected from the group consisting of, LIF, LIF-R, CT-1.

25. The method of any one of claims 17 to 23, wherein said transcription factor induce the expression of CT-1, a cardioprotective gene.

26. The method of any one of claims 17 to 23, wherein said transcription factor induce the expression of LIF.

27. The method of any one of claims 17 to 23, wherein said transcription factor induce the expression of LIF-R.

28. The method of claim 25, wherein the tissue is a muscular tissue.

29. The method of claim 26, wherein the muscular tissue is a cardiac tissue.

30. A genetically modified muscular cell expressing a functional EPAS1 transcription factor or a functional analog thereof.

31. The cell of claim 30, wherein said cell is a myoblast, a skeletal muscular cell or a cardiac cell.

32. The cell of claim 30, wherein said transcription factor is inducible.

33. The cell of any one of claims 30 to 32, wherein said transcription factor induce the expression of at least one cell survival gene selected from the group consisting of LIF, LIF-R, CT-1.

34. The cell of any one of claims 30 to 33, wherein said transcription factor induce the expression of CT-1, a cardioprotective gene.

35. The cell of any one of claims 30 to 33, wherein said transcription factor induce the expression of LIF.

36. The cell of any one of claims 30 to 33, wherein said transcription factor induce the expression of LIF-R.

37. The cell of any one of claims 30 to 34, wherein it comprises a cDNA encoding said transcription factor.

38. A modified cell that contains the nucleic acid of any one of claims 1 to 12.

39. The cell of claim 38, wherein said cell consists of a cell selected from the group consisting of myoblast, mammalian skeletal muscular cells, cardiac cells, bone marrow cells, fibroblasts, smooth muscle cells, endothelial cells, endothelial progenitor cells and embryonic stem cells.

40. A transgenic animal generated from the cell of claim 38 or 39, wherein said nucleic acid is expressed in said transgenic animal.

41. Use of a nucleic acid sequence encoding a functional EPAS 1 transcription factor or a functional analog thereof for the treatment of peripheral vascular disease.

42. Use of a nucleic acid sequence encoding a functional EPAS 1 transcription factor or a functional analog thereof for the treatment of wound healing.